

WILLMET, INC.

Thompson #3-36

NE NW SE, Section 36, T17N R9W

Hersey Twp., Osceola County

SAMPLE DESCRIPTION

- 0 - 625 Drift
- 625 - 908 Shale red to gray, soft to gummy calcareous, interbedded with sandstone, clean, medium grained, calcareous cement, well sorted, subround, trace red.
- 908 - 1426 Shale, gray black to dark gray, platy to blocky, firm, non-calcareous.
- Triple Gyp @ 1426 Sch
- 1426 - 1505 Anhydrite, white to cream to cream gray, firm.
- Brown Lime @ 1505 Sch
- 1505 - 1614 Dolomite, brown, cryptocrystalline, dense, hard with shale gray, black, soft to firm and anhydrite.
- Stray @ 1614 Sch
- 1614 - 1726 Sandstone, clear white, silica cement, fine grained, subround, moderately well sorted, with shale gray to black and firm.
- Marshall @ 1726 Sch
- 1726 - 1906 Sandstone, red to red brown, medium to fine grained, subround, 15% intergranular porosity, moderately well cemented with shale gray.
- Coldwater Shale @ 1906 Sch
- 1906 - 2646 Shale, gray to dark gray, blocky, soft to firm, slightly calcareous.
- Sunbury @ 2646 Sch
- 2646 - 2746 Shale, dark gray to black, blocky, carbonaceous, firm.
- Ellsworth @ 2746 Sch
- 2746 - 3141 Shale, gray to dark gray, moderately firm, slightly calcareous.
- Antrim @ 3141 Sch
- 3141 - 3363 Shale, black, very carbonaceous, firm, non-calcareous, trace pyrite.
- Traverse Formation @ 3303 Sch
- 3303 - 3364 Shale, black to brown, carbonaceous, with limestone, gray-brown, very finely crystalline, very argillaceous, shaly.

Traverse Limestone @ 3364 Sch

- 3364 - 3510 Limestone, tan-cream-buff, very fine to finely crystalline, trace intercrystalline porosity, clean, trace fluorescence and DDO stain, trace pyrite.
- 3510 - 3730 Limestone, buff-medium brown-cream, very fine to microcrystalline, 3% intercrystalline porosity, trace stain and fluorescence, no cut, dense.

- 3730 - 3888 Limestone, dark brown-tan-white, mottled, very finely crystalline, compact, trace intercrystalline porosity, trace fluorescence.

Bell Shale @ 3888 Sch

- 3888 - 3948 Shale, gray to light gray, soft to gummy.

Dundee @ 3948 Sch

- 3948 - 4016 Limestone, buff to tan, very finely crystalline, compact, trace intercrystalline porosity, clean.

Reed City Anhydrite @ 4016 Sch

- 4016 - 4032 Anhydrite, white.

Reed City Dolomite @ 4032 Sch

- 4032 - 4174 Limestone, tan-buff-white, grading to brown, 4-6% intercrystalline porosity, trace residual oil stain, no fluorescence, clean.

Detroit River Anhydrite @ 4174 Sch

- 4174 - 4238 Anhydrite.

Detroit River Salts @ 4238 Sch

- 4238 - 4648 Anhydrite, white to light gray, salt (by drill rate), with dolomite, buff, brown to dark brown, micro to cryptocrystalline, tight, compact.

Sour Zone @ 4648 Sch

- 4648 - 4772 Anhydrite, light gray to white with limestone, brown-buff-tan, very fine to finely crystalline; no fluorescence or stain.

Massive Anhydrite @ 47742 Sch

- 4772 - 4830 Anhydrite, white to cream, firm, with dolomite, brown.

Richfield @ 4830 Sch

4830 - 5089 Anhydrite, white to light gray, firm with limestone, buff-tan, very finely crystalline, compact, trace porosity, no fluorescence.

Amherstburg @ 5089 Sch

5089 - 5200 Limestone, black, dark gray, buff, finely crystalline, very argillaceous, no fluorescence, compact, tight.

Sylvania @ 5200 Sch

5200 - 5314 Sandstone, transparent, fine grained, calcareous, dolomite cement, moderately well cemented and well sorted, subrounded.

Bois Blanc @ 5314 Sch

5134 - 5473 Dolomite, brown to buff, no samples, back only LCM.

Bass Island @ 5473 Sch

5473 - 5771 Dolomite, light to medium gray to light to medium brown, cryptocrystalline tight, dense, hard with anhydrite, white and firm.

Salina G @ 5771 Sch

5771 - 5782 Dolomite, dark brown, very finely crystalline, dense, stylolytic.

F Unit @ 5782 Sch

5782 - 5829 Dolomite, dark brown, finely crystalline, dense, trace intercrystalline porosity, slightly limy.

F Salt @ 5829 Sch

5829 - 6403 Salt, massive, with shale, gray, soft to gummy and dolomite, dark brown, cryptocrystalline, dense.

E Unit @ 6403 Sch

6403 - 6520 Shale, red to gray, soft with siltstone, gray with dolitic cement.

D Salt @ 6520 Sch

6520 - 6572 Salt, white, with shale, gray.

C Shale @ 6572 Sch

6572 - 6666 Shale, gray, soft to gummy.

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B Salt @ 6666 Sch

6666 - 7041 Salt, massive with shale gray and soft at top.

A2 Carbonate 7041 Sch

7041 - 7180 Limestone, gray, dark gray to brown to dark brown, argillaceous, very finely crystalline, no stain or fluorescence, compact, tight.

A2 Evaporite @ 7180 Sch

7180 - 7544 Salt, massive.

A1 Carbonate @ 7544 Sch

7544 - 7600 Limestone, brown to black, very finely crystalline, compact, tight, argillaceous.

A1 Evaporite @ 7600 Sch

7600 - 7944 Salt, massive.

Niagaran @ 7944 Sch

7944 - 8069 Limestone, dark gray to brown, grading to light gray with pink to red, very finely crystalline, very compact, tight, stringers with red iron stain, no fluorescence or stain.

Clinton (Manistique) @ 8069 Sch

8069 - 8090 Limestone, red, trace white to gray, very finely crystalline, compact, tight, highly iron stained, no fluorescence, shaly.

8090 - 8196 Cored.

Cabot Head @ 8196 Sch

8196 - 8280 Shale, medium gray, very soft and calcareous, gummy, becoming solider toward base, with limestone, gray-brown, finely crystalline.

Manitoulin @ 8280 Sch

8280 - 8316 Limestone, dark gray to black, very fine to finely crystalline, trace intercrystalline porosity, dense with shale, medium gray, gummy, and calcareous.

Cincinnati @ 8316 Sch

8316 - 8365 Shale, green-gray, blocky, firm, moderately calcareous, grading to shale, red and gummy.

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DST #1

Interval 1690 - 1762

Opened with weak blow and remained weak throughout both periods, no gas recovered.
Recovered 330' of drilling fluid and 30' of formation fluid.

IHH	739.9	SIF	49
FIF	19.1	SFF	135.9
FFF	40.8	FSI	626.7
ISI	621.3	FHH	707.6

DST #2

Interval 3376 - 3400

1st Open - Opened with weak blow.

2nd Open - Opened with moderate blow.

No gas recovered, recovered 130' of drilling fluid.

IHH	1527.9	SIF	56.3
FIF	37.6	SFF	84.5
FFF	56.3	FSI	656.7
ISI	844	FHH	1527.9

DST #3

Interval 8130 - 8149

Gas to surface on 3 minute and flared gas throughout.

IHH	4720.9	SIF	1197.1
FIF	845	SFF	2960.7
FFF	2024.3	FSI	4712.8
ISI	4712.8	FHH	4720.9

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CORE

Interval 8090 - 8149
Cut 58.76'
Full Recovery

- 8090 - 8103.8 Limestone, tan and gray-tan with dark brown irregular laminae (rippled appearance), all finely sucrosic to microcrystalline, dense, tight.
- 8103.8 - 8107.2 Limestone, medium gray-brown, cryptocrystalline to microcrystalline mudstone. Dense, tight, no shows; heavily and irregularly laminated with dark, fine laminae.
- 8107.2 - 8131.4 Limestone, medium brown to medium gray, very finely crystalline, slightly sucrosic, dense, mudstone, tight, dense, no shows; 8112, faintly laminated with darker brown limestone, pyritic with disseminated pyrite and pyrite nodules 1mm - 1/2" in diameter.
- 8131.4 - 8135.1 Top of "Burnt Bluff" at 8135.1 Core
Dolomite, dark brown, very finely crystalline, finely sucrosic, dense, tight, slightly limy; banded with darker brown dolomite, non-limy, very finely crystalline, finely sucrosic, with scattered white fossil hash.
- 8135.1 - 8137.2 Dolomite, medium to dark brown, medium crystalline, highly sucrosic, with well developed intercrystalline porosity; slightly limy, scattered vugular and microvugular porosity and pinhole porosity; banded, as above.
- 8137.2 - 8144.5 Dolomite, dark brown, finely crystalline, sucrosic, fair to poor intercrystalline porosity, but with well developed vugular porosity throughout.
- 8144.5 - 8146.6 Dolomite, very dark brown, finely crystalline, slightly sucrosic, extremely porous with well developed vugular porosity ("rotten dolomite"). Porosity mostly vugular, matrix generally tight and dense with only limited intercrystalline porosity.
- 8146.6 - 8148.75 Dolomite, very dark brown to brownish-black, finely crystalline, sucrosic, with scattered vugular porosity - dense matrix, slightly limy, fair to poor intercrystalline porosity.

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CORE

Interval 8149 - 8196

Cut 47'

Recovered 43.2'

Lost 3'8"

8149 - 8161.2

Limestone, dolomitic, brown to dark brown, finely crystalline, trace sucrosic porosity, dense.

8161.2 - 8171.2

Limestone, gray to gray-brown, microcrystalline, tight, argillaceous, with an increase in fossil hash becoming more limy.

8171.2 - 8192.4

Limestone, brown to dark gray-brown, very finely crystalline to microcrystalline, argillaceous, slight trace of microsucrosic porosity.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)
Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER
36110
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Co. 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Thompson #3-36						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW SE		SECTION 36	TOWNSHIP T17N	RANGE R9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 460 Ft. from North		Line and 850		(East/West) Ft. from West		COUNTY NAME Osceola	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		Line and		(East/West) Ft. from		COUNTY NAME	
DATE	DRILLING BEGUN 9-25-82		TOTAL DEPTH OF WELL Driller 8366 Log 8362		TYPE WELL Gas		ELEVATIONS
	DRILLING COMPLETED 10-31-82		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8362		
	WELL COMPLETED 2-14-83		PRODUCING FORMATION(S) Clinton		FT. DRLD. - CABLE TOOLS From To		
				K.B. 1200.5		R.F. 1199.2	
						R.T. Grd. 1177.2	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
13 3/8	919'	900					YES	NO
9 5/8	5500'	300		1-5-83	2x/ft	8159 - 8162		XX
5 1/2	8366'	1200		1-6-83	2x/ft	8142 - 8152	XX	

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)				
Clinton	Gas						Samples	Odor	Pits	Mud Line	Gas Log
				Traverse Lm	Gas	3420					X
				Reed City	Gas	4150					X
				Sour Zone	Gas	4700					X

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
1-6-83	8142-8152	Acid 500 Gals.	None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	200-8362			2700	1/2°	X		8247
Birdwell		DLL-MLL	3300-8362			5100	3/4°			
		Sonic	200-8362			7461	1°			
						8340	1°			

PRODUCTION TEST DATA

Last Perf.

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H ₂ S - Grains/100 cu. ft.	B.H.P. AND DEPTH
		Nil	3000	2	Nil	4659 8152

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
2-15-83	William E. Booker, Geologist	William Booker

NOTICE: REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON SEPARATE SHEET